DOCUMENT RESUME

ED 439 586 EF 005 466

AUTHOR	Hansen, Shirley J.
TITLE	Canadian Schoolhouse in the Red. The First National Study of School Facilities.
SPONS AGENCY	Honeywell, Inc., Minneapolis, MN.; Ontario Association of School Business Officials, Toronto.
PUB DATE	1993-00-00
NOTE	32p.; The study and survey were conducted by Hansen Associates.
AVAILABLE FROM	Ontario Association of School Business Officials, Suite 5-110, 252 Bloor Street West, Toronto, Ontario M5S 1V5 Canada.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Academic Achievement; *Building Obsolescence; Data Collection; Elementary Secondary Education; *Energy Management; Foreign Countries; Operating Expenses; *Public Schools; *School Construction; *School Maintenance
IDENTIFIERS	*Canada

ABSTRACT

A Canadian national study provides provincial data on the country's publicly funded school facilities including school building age, student achievement and school condition, fiscal condition, maintenance, and energy usage. The study reveals that education ministries and school systems have engaged in an aggressive building program in the past two decades at a rate approximately nine percent higher than that in the United States. Despite this effort, most of the country's school buildings have exceeded their life expectancy, and too often new construction has been done at the expense of needed maintenance. It also shows that 1 in every 6, or 2,308 Canadian schools, are considered inadequate places for learning. Appendices present research procedures and respondent data, and comparable data regarding U.S. school facilities. (GR)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 439 586

Canadian Schoolhouse in the Red

The first national study of school facilities

Shirley J. Hansen, Ph.D.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sam MacKinlay

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

EF 005 466

Ontario Association of School Business Officials

Sponsored by:

Honeywell

BEST COPY AVAILABLE

Canadian Schoolhouse in the Red

Author: Shirley J. Hansen, Ph.D.

Ontario Association of School Business Officials
Suite 5 - 110, 252 Bloor Street West
Toronto, Ontario
M5S 1V5

1993

Contents

INTRODUCTION 3

CANADIAN OVERVIEW 8

BRITISH COLUMBIA 12

ALBERTA 14

SASKATCHEWAN 16

MANITOBA 18

ONTARIO 20

QUEBEC 22

ATLANTIC PROVINCES 24

APPENDIX A 26

APPENDIX B 27

Introduction

Intuitively, Canadians have always known that classrooms which are too cold, too hot, or in total disrepair can affect the way children learn. Now, increasing evidence suggests that building conditions make a direct measurable difference in student achievement. Yet, each day nearly 800,000 boys and girls attend substandard schools. Concerned about the quality of the learning environment and mounting building renewal needs, the Ontario Association of School Business Officials (OASBO) determined in late 1992 that an assessment of education facilities was urgently needed.

The *Canadian Schoolhouse in the Red* study compiled available data on the country's publicly funded school facilities, educational finance, environmental and energy concerns. OASBO then commissioned the first national survey of school facilities.[1] The support and cooperation of other provincial school business official groups added an important dimension to the study.

The study revealed that education ministries and school systems[2] have engaged in an aggressive building program in the past two decades. The recent Canadian building pace exceeds the rate in the United States for the same period by nine percentage points. (For comparative data on U.S., see Appendix B.) Despite this effort, however, most of the country's school buildings have exceeded their life expectancy, and too often new construction has been done at the expense of needed maintenance. Of even greater concern, one building in every six, or 2,308 schools across Canada, are considered inadequate places for learning.

THE LEARNING ENVIRONMENT

Eight out of ten administrators in Canada think the condition of a school facility is a "key factor" (65%) or "absolutely critical" (18%) to student achievement. A Carnegie Foundation report helped pinpoint part of the reason, stating:

> *...the tacit message of the physical indignities in many urban schools is not lost on students. It bespeaks neglect, and students' conduct seems simply an extension of the physical environment that surrounds them.*

[1] The study and survey were conducted by Hansen Associates for OASBO, with funding provided by Honeywell Limited. All school boards in Canada as listed by Ontario Institute for Studies in Education were surveyed and 42% responded. Less than 1% of the respondents were from schools which are primarily funded with private capital; so care should be taken in applying the findings to private school conditions. More information on the research design and respondent data are presented in Appendix A.

[2] When referring to Canadian or Atlantic Province schools collectively, this study uses the term "system" since individual provinces have different terms for their organizing bodies, e.g., "board," "district," "division."

How would you feel? Your friend is in a new school that is bright, clean and well equipped, while you are in an older school with no computer labs, twenty year old desks and no air movement. Wouldn't you want to switch too? In a second!

Steve Barnett
Chiliwack School District

That poor school facilities impact negatively on the opportunity for our kids to learn is not the question. When we are going to address this critical issue is.

Ron McKnight
Superintendent of Plant
York Region Board of Education

The message to students is clear: **"What is going on inside is not important!"** according to one urban school committee in response to evident facility neglect. The committee added that attitudes and discipline problems fostered by such an environment "in turn contribute to poor performance."

In a recent study by Edwards[3], architects and engineers surveyed the buildings in an urban school system and evaluated them as being in "poor," "fair," or "excellent" condition. An assessment of student achievement in the 52 schools was then made. Through the use of regression analysis (to remove variables that are known to influence achievement, such as socioeconomic status), a strong correlation between building condition and student achievement was revealed. The findings revealed students assigned to schools in "poor" condition could be expected to fall 5.5 percentage points behind those in the "fair" schools and 10.9 percentage points behind those housed in schools that were in "excellent" shape.

BORROWING ON CANADA'S FUTURE

Pressed to meet current needs from limited resources, deferred maintenance has grown to a $992 million burden for schools. With a large percentage of older buildings, the focus on new construction, and the tendency to cut maintenance to meet other needs, the problem is apt to get worse. Half of the school systems in the country and the majority of systems in every province except British Columbia and Alberta cite building deterioration and/or deferred maintenance as their biggest facility concerns. These problems are greatest in large school systems.

Studies have shown that indoor air quality is definitely a factor in productivity in the workplace. Ventilation systems that are in disrepair or non-existent, take away from the ideal learning environment.

Mike P. Graham
Superintendent, Education/Plant
The Durham Board of Education

Schools are about more than teaching of academics. They are about developing the attitudes of our country's healthy future citizens. One must ask how politicians, policy makers and educators can expect children to develop to their full potential in sub-standard learning environments, which without words, send a message of hopelessness to the children.

Trudy Lum
Superintendent of Curriculum
Northumberland and Newcastle
Board of Education

Direct deferred maintenance costs are only part of the story. Putting off needed maintenance ultimately causes:

- ✓ premature building deterioration;
- ✓ more repair and replacement of equipment;
- ✓ more indoor air problems; and
- ✓ less efficient operation.

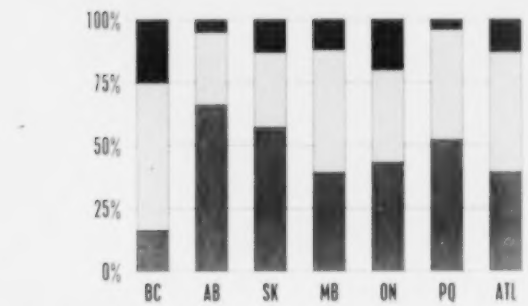
Another 11% of the school systems listed indoor air quality as their biggest facility issue.

A vicious cycle emerges, where less efficient operations increase energy consumption. Higher consumption, in turn, causes higher utility bills and a greater drain on the maintenance budget.

[3] Edwards, Maureen M. *Building Conditions, Parental Involvement, and Student Achievement in the D.C. Public School System.* Georgetown University, 1991.

THE CONDITION OF CANADIAN SCHOOL FACILITIES

This study asked administrators to list the number of their buildings in "good to excellent" condition as well as the number in "adequate" and "inadequate" condition.[4] Responses varied from 66% good to excellent in Alberta to 16% in British Columbia. Conversely, British Columbia had a high of 25% inadequate, while Quebec administrators reported only 4% in that condition.



	BC	AB	SK	MB	ON	PQ	ATL
Inadequate	25	5	13	12	20	4	13
Adequate	59	29	30	49	37	44	48
Excellent	16	66	57	39	43	52	39

If Edwards's fair and poor categories are taken as comparable to the *Canadian Schoolhouse in the Red* project's adequate and inadequate, over two million students in "adequate" buildings could be penalized by five percentage points compared to their more fortunate counterparts in excellent schools. Another 780,000 students, being sent to "inadequate" schools, could be handicapped by as much as 10.9 percentage points, which could be denying Canadian youth university opportunities. If further research should bear out these findings, each province and every affected school system must become keenly aware that we are placing a burden on our students that is simply not acceptable.

BUILDING RENEWAL IN HARD ECONOMIC TIMES

Building renewal is a crucial concern, but it takes money to do the job. In addition to the deferred maintenance costs already cited, renovation needs, environmental concerns and legislative mandates bring total non-growth construction needs to $1.6 billion. Where borrowing is permitted, debt ceilings, provincial approval procedures, and higher interest rates due to lower bond ratings inhibit such procedures.

While revenue sources for schools vary from province to province, all provinces and their school systems are financially hard pressed. Loans are available to schools in some provinces, but not all. Options are limited. One source of "revenue" that schools can obtain for themselves is to increase energy and operating efficiency through assistance from utilities and the private sector, and actually access immediate financial resources from their future energy and operational savings. This option was explored in the survey and the data analysis revealed that the schools could recapture $300 million per year in new "revenue" by employing greater energy and operational efficiencies. That's roughly $228 lying on the floor of every classroom in Canada just waiting to be picked up... every year.

The greatest reason schools do not access this "revenue" is the lack of funds to do the job. The second most pervasive reason is the need to meet educational program needs out of the limited resources available. 23% of the schools have filled this gap by using funds from the private sector and 25% intend to take advantage of this assistance in the future.

[4] "Inadequacy" was self-defined by the respondents and could be influenced by the terminology used within the provinces or in capital funding formulas.

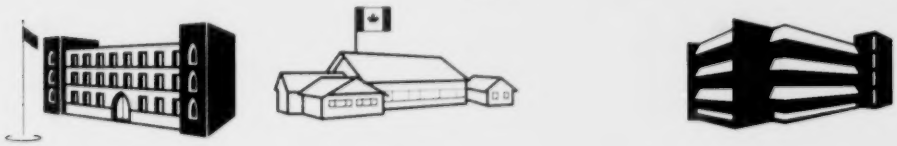
SCHOOL BUILDINGS AGE

School administrators were asked to indicate the decades in which their buildings were constructed. 66% were found to be before 1950 or 1950s-60s "baby boom" construction, while 34% have been built since 1970.

In their survey responses, some administrators offered information on additions and major renovations; however, no attempt was made to establish the year or extent of such modifications. Nor, was any attempt made to quantify the extent to which reported structures were actually relocatables (semi-permanent portable classrooms). The present adequacy of school facilities was deemed a more important indicator.

Beyond Predicted Useful Life **66%**

Viable Building Stock **34%**



Before 1950 1950s..60s Post-1970

CANADIAN SCHOOL CONSTRUCTION

DATA ANALYSIS & PRESENTATION

In order to achieve greater consistency in the analysis, only elementary and secondary school data were used, as the facilities used for special education and pre-grade one, as well as the way in which they are designated, varies from province to province. The only exceptions were those instances when the topic expressly addressed all school facilities, and they are specifically noted. Only the figures for elementary/secondary enrolments were used in the data analysis. For analysis purposes, it was assumed that the 1991-92 student enrolment of 5,210,100 students was relatively evenly dispersed in the 15,390 elementary/secondary buildings. Figures in the demographic box for each province were taken from Statistics Canada, 1991-92; so the data would be consistent by date and source. Survey data reported are solely from responses received from school systems across Canada.

Insufficient data were obtained to include any meaningful information on the Yukon and Northwest Territories. In examining the data, it also became apparent that it would be statistically desirable to report the data from the Atlantic Provinces collectively.

In interpreting the findings presented in this report, it should be noted that survey results reflect the conditions for a majority of systems within a province and the country, but not necessarily an individual school system. In every province, there are systems like Lloydminster, Alberta, where the Facilities Administrator, G. Roy Clark observed, "This District has always had a good commitment to building caretaking and maintenance....The schools are in excellent shape, though components are aging."

Other problems, not noted in the report, complicate the situation for certain school systems. Representative of many rural schools, Wood River in Saskatchewan serves 772 students in a geographic area of 7600 sq. km. The sparse population necessitates long bus routes to take few pupils to multi-graded classrooms. Five of the K-8 schools have less than 50 students, some in very old buildings with health and safety concerns. Yet, circumstances make it very difficult to justify the expense of major renovation or replacement.

Since education is very much a provincial matter and the governance and financing procedures are quite disparate, data for each province (except the Atlantic Provinces) is reported as well as a composite picture of Canadian schools. Despite the unique characteristics of education in each province, many of the issues were relatively consistent across Canada. To facilitate provincial comparisons, the data on each province are presented, to the extent feasible, in a parallel format.

THE CHALLENGE

As a country and in our individual provinces, our school facilities are not keeping pace with the growing expectations for Canadian education. If we are to meet the challenge of providing quality education for every Canadian student, then we must engage in systematic renewal of our facilities. We must join in creating facilities that show we care about education of our youth and about Canada's future, and show each student that, "what's going on inside is important."

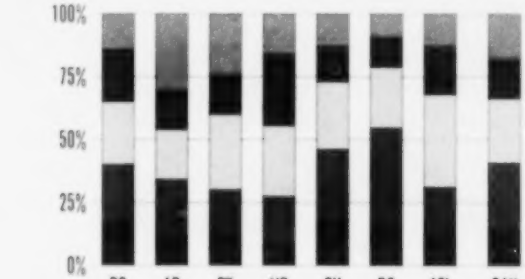
Canadian Overview

Student Enrolment: 5,210,100
School Buildings: 15,390
School Systems: 853

Educational Funding: $27.5B

BUILDING AGE

Canada's school building stock is growing old. Two out of three buildings today have exceeded their predicted useful life. 53% are 1950s-60s buildings. Built inexpensively to meet the burgeoning "baby boom," they were designed with an average life expectancy of 30 years. 14% of the buildings were constructed before 1950. The greatest percentage of older buildings are in the East, particularly Ontario and Quebec.



	BC	AB	SK	MB	ON	PQ	ATL	CAN
>1980	13	30	24	16	13	9	13	18
1970-80	21	16	16	28	14	12	19	16
1960-70	25	20	30	28	27	24	37	26
1950-60	23	22	17	19	28	38	18	27
<1950	17	12	13	8	18	16	13	14

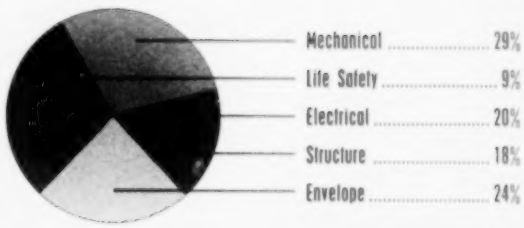
Age of Canadian School Buildings by Decade of Construction

STUDENT ACHIEVEMENT AND THE CONDITION OF CANADIAN SCHOOLS

Across the country, eight out of ten school administrators expressed the strong belief that building conditions and the learning environment have a major impact on student achievement. This strong belief was reflected in every province, as a large majority of administrators in each province indicated the learning environment was a "key factor" or "absolutely critical" to student achievement.

Despite their age, just under one-half of all buildings are in "good to excellent" condition and 39% are considered "adequate."

15%, however, are considered "inadequate" places for children to learn. 2,308 buildings, housing nearly 800,000 students each day, are substandard, a condition which most administrators believe adversely affects student achievement. 29% of the inadequate buildings' problems are rooted in mechanical concerns, while 24% are related to the envelope (the building shell, including roofs, walls, floors, windows and doors).



Reasons for Building Inadequacy

When examined province by province, Alberta, Saskatchewan and Quebec have the highest percentage of buildings in excellent condition. British Columbia has the lowest percentage of buildings in excellent condition and the highest percentage of inadequate facilities (25%). Ontario has the second highest percentage of inadequate buildings at 20% and Quebec has the lowest at 4%.

Adequacy was also assessed by the size of the school system enrolment: i.e., small (<1,000), medium (1,000-8,000), and large (>8,000). The figures in Table 1 reveal that small systems have the most excellent and the most inadequate facilities. Large systems and small ones clearly have the most problems providing adequate learning environments.

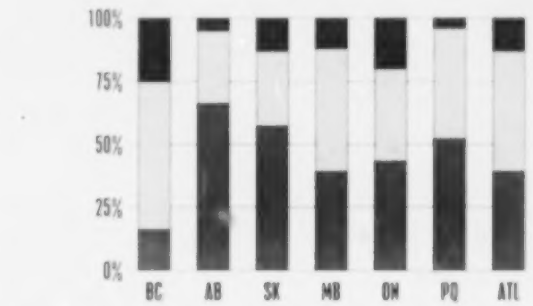


TABLE 1. BUILDING ADEQUACY (%)
by School System Size

Building Condition	Small <1,000	Medium 1,000-8,000	Large >8,000
Excellent	54%	48%	45%
Adequate	21%	40%	39%
Inadequate	25%	12%	16%

Numbers of school buildings or their percentages do not adequately reveal the full impact of facility conditions on children. It becomes more real when we consider that on each school day, 51,580 students enter 152 buildings that the administrators have characterized as *"fire hazards."* Or, nearly 200,000 Canadian children attend school in buildings described as *"unsafe or unsound."*

ENROLMENT SHIFTS

The question of school facility adequacy is compounded by projected growth in enrolment, particularly from the in-migration (new students to the system) of students. More of British Columbia's school districts expect an influx of students than the other provinces. Over the 1993-95 span, nearly 75% of the British Columbia districts expect increases compared to the next fastest growing province, Alberta, where 45% of the districts expect increased enrolments. Ontario has the third largest percentage of boards expecting growth at 38%.

Urban systems and large systems (>8,000) are more apt to increase in size in each of the next three years. In 1994 and 1995, more small and rural systems expect growth than medium-sized or mixed rural/urban systems.

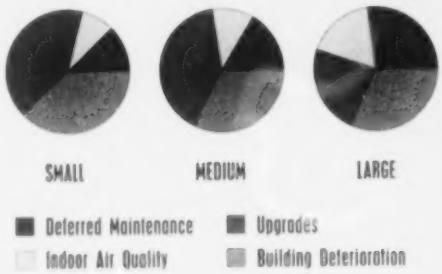
Over half the Saskatchewan divisions expect enrolment declines in each of the 1993-95 years. The Atlantic Provinces have the next highest percentage of systems (43% over three years) expecting to lose students; followed closely by Quebec at 41% for the same time span. More rural and medium-sized (1,000-8,000) systems expect to lose students in each of the three years than in any other geographical or size categories.

BIGGEST FACILITY ISSUES

Across Canada, four issues were consistently identified and varied only slightly by province in their relative importance:

- ✓ Building deterioration (30%)
- ✓ Upgrades to meet educational needs (30%)
- ✓ Deferred maintenance (16%)
- ✓ Indoor air quality (11%)

Building deterioration was uniformly a problem for all size systems, while problems with deferred maintenance and indoor air quality seemed to grow with the system size. The need to upgrade facilities to meet educational program needs was greatest in mid-sized systems and lowest in large systems.



Recognizing the burden of old, out-of-date buildings and growing enrolment needs, administrators placed new construction needs at $4.5 billion, or $872/student. Average costs varied widely by province from $217/student in Manitoba to $2077/student in British Columbia. In descending order, other average per student costs were: Alberta, $1190; Atlantic Provinces, $1167; Quebec, $744; Ontario, $670; and Saskatchewan, $399.

THE HIGH COST OF DEFERRED MAINTENANCE

In the face of increasing demands on limited revenues, schools put off maintenance work. As a consequence, deferred maintenance costs have grown to a $992 million burden for the country's schools. And the problem is apt to get much worse. Older building stock demands more maintenance, not less. The focus on new construction has a tendency to slight the needs in existing facilities.

The biggest burden carried by any province to date is in Ontario, where deferred maintenance costs have reached $396 million ($192/pupil). British Columbia carries about one-half Ontario's burden, but the cost per pupil ($328) is higher. Quebec has the third highest provincial need, but per pupil costs ($142) are relatively low. While the provincial total is not as high, Alberta is faced with deferred maintenance costs that exceed $244/pupil.

Unfortunately, the costs don't stop with deferred maintenance needs. Deferred maintenance accelerates building deterioration, causes most indoor air

quality problems and increases equipment repair and replacement needs – plus exacerbating operational inefficiencies. As a result, the utility bills go up even further, maintenance budgets are cut even deeper and the whole vicious cycle starts over again.

44% of Canadian administrators believe their inadequate facilities are the result of deferred maintenance. The relationship to student achievement is not lost. School systems are not only borrowing on the future of their buildings and accelerating their decline, but they are borrowing on the future of their students – and Canada's future as well.

Cost Burden by Province

PUTTING ENERGY SAVINGS TO WORK

The average amount budgeted in Canada for electricity and heating/cooling fuels in 1992-93 was $124/pupil, or a total of $646 million to meet elementary/secondary student needs. This was an increase of 6.9% over the amount spent in the preceding year. More than one system in ten, however, did not think this would be enough.

Over half the school systems in Canada have not established an energy program or taken the first comprehensive step – an energy audit – to gain operating energy efficiency. Of those who have conducted an audit, 30% have failed to act on the recommendations. 62% of the school systems in Canada do not have an effective energy program in place. 14% have never had a program, 42% are currently trying to get one going, and 4% have old programs that are no longer effective.

30% of the school systems have never conducted an energy audit in any of their buildings. The problem gets worse as the system gets smaller. For the small systems of less than 1,000 enrolment, over one-half have not conducted any audits.

Experience has shown that school systems can typically reduce energy consumption by 25% and that subsequent operation savings can often double those energy savings. This means the country's schools have more than $300 million per year ready to be recaptured. That's roughly $228 lying on the floor in every classroom in Canada just waiting to be picked up.

So why don't the schools pick up that money? The old adage that it takes money to make money was never truer. The major barrier in every province and across the school systems of Canada is the general lack of funds to do the job. The financial demands for educational programs from the schools' limited resources constitute another barrier. Too few personnel and the demands for this limited staff to do non-energy related maintenance cut deeply into any "do-it-yourself" hopes.

Fortunately, the private sector stands ready to help schools access future energy and operational savings to buy equipment, upgrade facilities and cut operating costs to help the systems meet their more pressing educational needs. 23% of Canada's school systems have used private sector financing and services, and 25% plan to do so in the future.

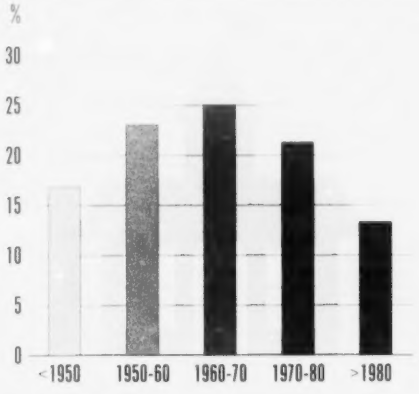
British Columbia

Student Enrolment: 593,200
School Buildings: 1,986
School Districts: 75

Educational Funding: $2.67B
Provincial Share: 100%

BUILDING AGE

Two-thirds of B.C. schools have outlived their predicted useful life. Nearly half of the schools are "50s-60s" buildings, originally designed to last approximately 30 years. Another 17% were built before 1950.



School Construction by Decades

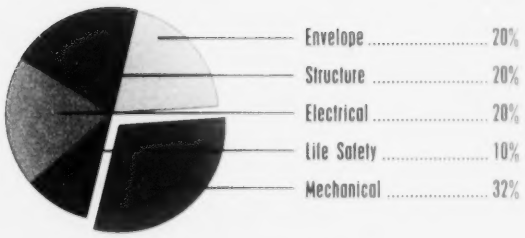
STUDENT ACHIEVEMENT AND THE CONDITION OF B.C. SCHOOLS

Nearly half the administrators surveyed think the learning environment is a "key factor" to student achievement, while another third think it is "absolutely critical." 85% of the administrators view the need to upgrade facilities to meet educational program needs as their biggest facility issue.

While 16% of the schools are in excellent condition and 59% are considered adequate, one school in four, or 25%, is deemed an inadequate place for children to learn. 148,000 British Columbia students go to school each day in substandard schools.

The major reason B.C. schools are inadequate is "poor," "old," and "non-existent" mechanical systems.

Of the 20% who attribute their problems to poor structures, 65% say they are unsafe or unsound. This high percentage may be attributed to the seismic studies underway in the province. For whatever reason, however, 19,279 students attend school each day in buildings their administrators have rated as "unsound" or "unsafe."



Reasons for Building Inadequacy

A PATTERN OF DECLINE

When utility bills exceed the budget, 80% of the school districts cut maintenance to pay the bill. Not surprisingly, 55% of the administrators indicate that their inadequate facilities are the result of deferred maintenance. Deferred maintenance costs currently exceed $195 million. And the problem continues to grow. Schools budgeted 11% more for energy in 1992-93 than they spent in 1991-92, and 25% of the districts did not believe this would be enough to cover anticipated cost increases.

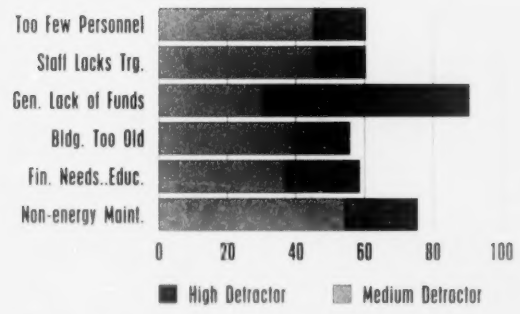
The "Fiscal Framework" funding procedure relies on provincial sources for roughly 98% of the district revenues. This relatively new provincial funding pattern is viewed as funding new construction more adequately than meeting maintenance and renovation needs. The problem is compounded by the 35% enrolment growth administrators expect in the next three years.

ENERGY: THE PROBLEM AND THE OPPORTUNITY

Since higher utility bills are making an inordinate drain on maintenance, thus contributing to the high percentage of inadequate schools, reducing energy costs offers an attractive alternative. 65% of the districts do not have effective energy programs and 25% have yet to do an energy audit in any of their buildings. Energy program status in British Columbia schools suggests that of the $35 million in 1991-92 energy costs, potential annual energy cost savings should be at least $7 million/year.

Experience has shown that schools typically can make subsequent operational savings equal to, or greater than, the energy cost savings.

Unfortunately, under the current provincial funding procedures, there is no incentive for school districts to undertake energy efficiency measures. Under the Function 5 allocation procedure, the schools are, in effect, penalized in their next year's budget for having cut utility costs. School administrators and provincial leaders both anticipate that this provision will change in the near future.



Major Barriers to Energy Efficiency Work

Even with incentives in place, other barriers remain. The greatest barrier perceived by administrators is the general lack of funds (90%). The present provincial fiscal condition limits public sources to meet this need. 10% of the districts have used private sector financing in the past and 25% hope to use it in the future.

The focus on new construction, which has helped the province establish itself as having among the highest post-1970 school construction, has detracted from needed attention to existing facilities. The province is not adequately protecting its investment in school building stock. The effective use of dollars now going for wasted energy could help turn this around.

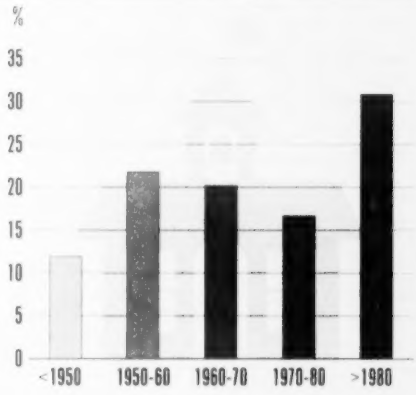
Alberta

Student Enrolment: 523,900
School Buildings: 1,730
School Districts: 143

Educational Funding: $2.5B
Provincial Share: 63%

BUILDING AGE

Alberta's active building program since 1980 gives the province the highest percentage of new buildings. Despite this activity, over half (54%) of the province's school buildings have outlived their life expectancy. 42% are 50s-60s "baby boom" buildings designed to serve about 30 years. 12% are pre-1950 structures.



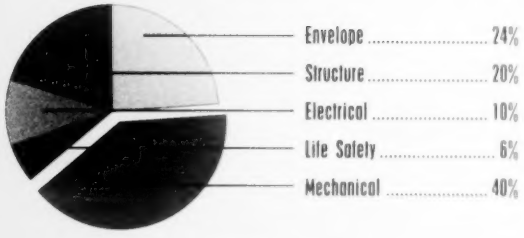
School Construction by Decades

STUDENT ACHIEVEMENT AND THE CONDITION OF ALBERTA SCHOOLS

Four out of five school administrators in Alberta think the quality of the learning environment is key (61%) or absolutely critical (20%) to student achievement.

This concern is reflected in the very high percentage of Alberta school buildings in excellent condition (66%) and the relatively low percentage (5%) that are considered inadequate places for children to learn.

Nevertheless, these figures mean that 26,195 Alberta students still must attend school in substandard buildings. For these children, their parents and teachers, the number is still too high.



Reasons for Building Inadequacy

Of the 87 buildings characterized as inadequate places for children to learn, the biggest problem is old and outdated mechanical systems (40%). 15% indicated they had problems with ventilation and indoor air quality.

Of the 20% who expressed concern about the structure of their inadequate school buildings, 40% declared them unsafe and unsound.

54% indicated their biggest facility problem was the need to upgrade facilities to meet program needs. 20% expressed concern about the extent of building deterioration.

SPECTRE ON THE HORIZON

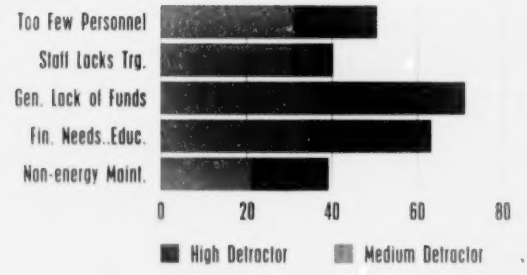
45% of the districts rely on reserve funds to cover their utility bills that exceed the budgeted amount; however, this may not last, as administrators budgeted 13% more for energy this past year and 16% felt this would not be enough. 64% reported increased energy consumption greater than 10% over the last three years; 21% an increase greater than 20%. In the face of these figures and the province's fiscal condition, questions quickly focus on how soon the reserve funds will be depleted and how many more school districts will join the 39% that now cut maintenance to pay the utility bill.

Estimated deferred maintenance costs exceed $128 million. 27% of the administrators believe deferred maintenance has been a significant contributor to their buildings' inadequate shape.

ENERGY: THE OPPORTUNITY

Since inroads on the maintenance budget from energy expenditures loom large in the Alberta schools' future, curtailing those energy costs would: (1) help preserve the generally good condition of most schools; (2) make positive impacts on "inadequate" schools, and (3) provide funds to upgrade facilities to meet educational needs.

Since more than 70% of the school districts do not have effective energy programs and 36% have not audited any of their buildings, the opportunity to cut at least $14 million out of their $58 million energy budget looks very good. The energy savings and the subsequent operational savings could yield valuable "revenues."



Major Barriers to Energy Efficiency Work

The major reason school administrators don't engage in energy activities to capture these "revenues" is the lack of funds (71%), followed closely by the educational program demands on their resources (64%). While Alberta is in a better fiscal condition than some provinces, it does not appear to have the fiscal resources to fund the energy opportunity in school facilities. 18% have used private sector energy financing in the past, and 25% indicate they will use this assistance in the future.

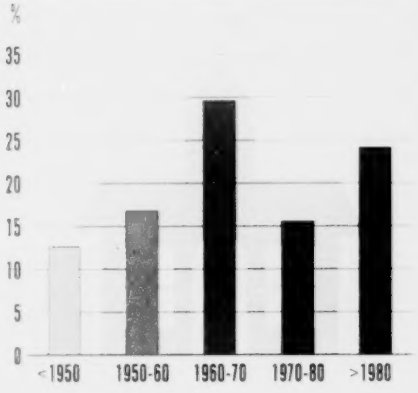
Saskatchewan

Student Enrolment: 211,300
School Buildings: 979
School Divisions: 115

Educational Funding: $955M
Provincial Share: 46%

BUILDING AGE

60% of Saskatchewan school buildings are living on borrowed time. 47% are the 50s-60s buildings originally intended to last about 30 years, and 13% were built before 1950. Saskatchewan does, however, have the second highest percentage (24%) of post-1980 buildings.

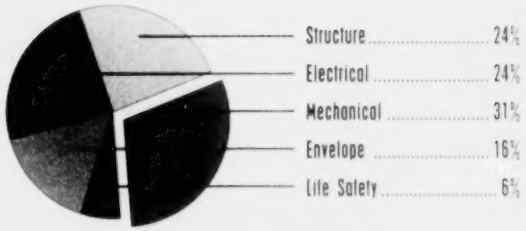


School Construction by Decades

STUDENT ACHIEVEMENT AND THE CONDITION OF SASKATCHEWAN SCHOOLS

52% of Saskatchewan administrators expressed the opinion that the learning environment is "key" to student achievement and 18% indicated it was "absolutely critical." 57% of the provincial buildings are in excellent condition and another 30% in adequate shape.

Despite these positive indications, 27,469 Saskatchewan students go to school each day in buildings deemed inadequate for learning by their administrators. Of the 127 inadequate buildings, mechanical difficulties are the biggest concern in 31%, while structural and electrical concerns each account for 24%. Life safety is a concern in 6% of the buildings.



Reasons for Building Inadequacy

FACILITY OUTLOOK

Saskatchewan school buildings are in relatively good condition. The aggressive building program in the last two decades has helped. Still, concerns about the care of existing facilities are emerging. The biggest facility issue is building deterioration (26%), and another 18% claiming deferred maintenance is their biggest headache. 22% find their greatest concern is upgrading existing facilities to meet educational needs.

27% indicated that their inadequate facilities are the result of deferred maintenance. The deferred maintenance price tag exceeds $20 million.

ENERGY: A CLEAR OPPORTUNITY

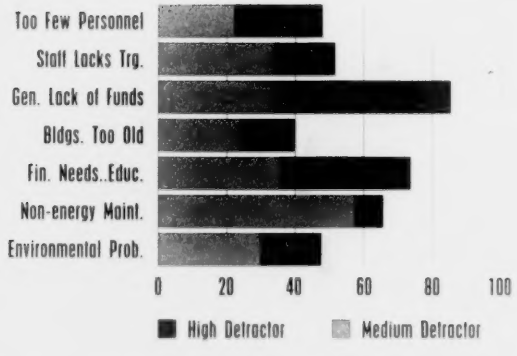
Saskatchewan schools have been the least active of any province in pursuing energy efficiency. 32% of the divisions have no energy program and another 42% are just getting started. Only 18% have effective programs in place. Over half the school divisions have yet to audit any of their buildings.

When utility bills exceed the budget, 30% of the divisions target maintenance to cover the overruns while 46% still rely on reserve funds. The schools increased their energy budgets by 4% to $113 per pupil for 1992-93 and, at the time of the survey, all but 2% thought this would see them through the year.

Saskatchewan schools should be able to reduce their energy costs by $5.75 million per year. With an amount equal to, or greater than, the energy cost savings available through subsequent operational measures, Saskatchewan schools have an opportunity to access more than $10 million per year to meet deferred maintenance and educational program needs.

Since so little energy activity has taken place, the barriers to energy efficiency work were carefully analyzed. Most school divisions cited multiple barriers with an average of eight factors that detract for each division. The most frequent problem was the lack of funds (92%) followed by demands of the educational program on existing resources (86%). The province's fiscal condition suggests only limited funds will be available to address the energy opportunity; yet, only 4% have used private sector energy financing in the past and only 6% plan to use it in the future.

The provincial school facilities are in relatively good shape. Fears regarding building deterioration and deferred maintenance could be alleviated by using the funds now being paid for wasted energy. There exists an excellent opportunity to use dollars going up the smokestack to better protect the public's investment in its schools.



Major Barriers to Energy Efficiency Work

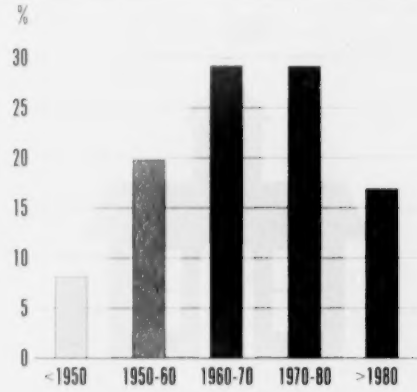
Manitoba

Student Enrolment: 220,200
School Buildings: 850
School Divisions: 53

Educational Funding: $1B
Provincial Share: 70%

BUILDING AGE

More than half of Manitoba's buildings are living on borrowed time. 47% are 50s-60s "baby boom" buildings, designed to last about 30 years, and another 8% were built before 1950. Manitoba's post-1970 construction, however, is among the highest in the nation.



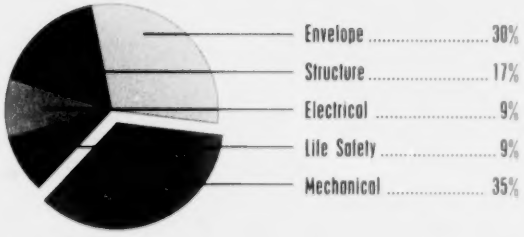
School Construction by Decades

STUDENT ACHIEVEMENT AND THE CONDITION OF MANITOBA SCHOOLS

Nine out of ten administrators believe the learning environment is "key" (66%) or "absolutely critical" (24%) to student achievement.

Manitoba is fortunate enough to have 39% of its buildings in excellent condition and 49% in adequate shape. Unfortunately, 12% are inadequate, substandard facilities. Over 26,000 children attend school each day in these inadequate schools.

Of the 102 inadequate buildings, the biggest problem cited by school people is mechanical (35%) mostly due to old systems. Envelope problems account for 30%. Building deterioration and poor design are equally responsible for the 17% with inadequate structures. No Manitoba facilities are considered unsafe or unsound.



Reasons for Building Inadequacy

AN UNEASY FUTURE

The biggest facility problem facing Manitoba school divisions is building deterioration (41%). Empirical data underscores that indoor air concerns (the major concern for 24% of the divisions) are frequently related to inadequate maintenance and building deterioration. 21% of the administrators named the need to improve facilities to meet educational needs as their biggest issue.

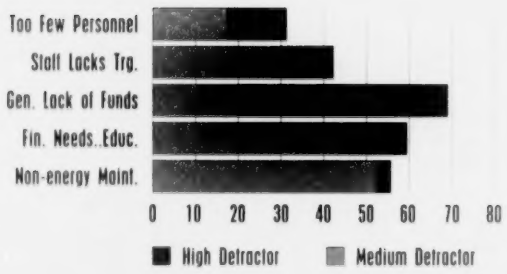
Nearly one-half of the school divisions in Manitoba have been able to use reserve funds to pay unexpectedly high utility bills. 38%, however, have had to cut maintenance to meet utility bills that exceeded the budget. The per pupil cost for energy ($147 spent in 1991-92) is 26% higher than the Canadian schools' national average. Costs jumped 7.3% in 1992-93. With a heavy energy cost burden and the fiscal problems in Manitoba, how long can schools rely on reserve funds?

Additional divisions may soon be delving into the maintenance budget to meet these high energy costs. The deferred maintenance is currently estimated at $33 million. 31% of Manitoba's administrators expressed concern that deferred maintenance seriously contributed to their inadequate facilities.

ENERGY: THE OPPORTUNITY

The relatively high energy costs in Manitoba make this portion of the budget an attractive place to find new "revenues."

High energy costs have also prompted considerable activity by the schools in the energy area. Over half of the school divisions have effective energy programs and 79% have conducted energy audits in some of their buildings. Even with this level of energy activity, potential energy cost savings could easily exceed $5 million per year. Subsequent operational savings would augment these energy cost savings.



Major Barriers to Energy Efficiency Work

The greatest barrier to accessing these "revenues" from existing facilities is the general lack of funds, coupled with the financial demands placed on the budget to meet educational needs. With limited resources at the provincial level, the schools need to look elsewhere for assistance. 41% have used private sector energy efficiency financing in the past and 35% intend to use it in the future.

While Manitoba enjoys a relatively high percentage of newer buildings in adequate to excellent condition, the growing deferred maintenance burden threatens the public's investment in its existing school buildings. The high level of concern about poor indoor air quality, which is known to adversely affect productivity, threatens the learning environment.

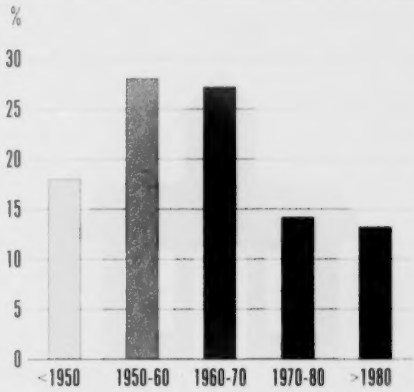
Ontario

Student Enrolment: 2,059,200
School Buildings: 5,346
School Boards: 170

Educational Funding: $12.3B
Provincial Share: 43%

BUILDING AGE

Ontario schools suffer from a large percentage of buildings (73%) that have outlived their life expectancy. The province has the highest percentage of pre-1950 buildings (18%) and is exceeded only by Quebec in the number of 50s-60s buildings.



School Construction by Decades

STUDENT ACHIEVEMENT AND THE CONDITION OF ONTARIO SCHOOLS

88% of the Ontario administrators believe that the learning environment is a "key factor" or "absolutely critical" to student achievement.

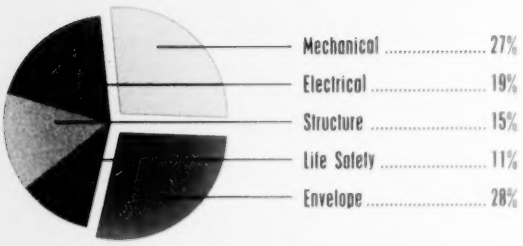
Despite the age of the school buildings, 43% are considered to be in excellent condition and 37% are considered adequate. 20%, however, are considered inadequate places for learning. Over 411,000 students are required to attend school in substandard buildings that most Ontario administrators believe have an adverse effect on achievement.

BORROWING FROM THE FUTURE

Fiscal conditions prompt administrators to use deferred maintenance as a way to borrow from the future. Unfortunately, this practice does little to protect the public's investment in the schools' major asset – their buildings.

1. The biggest facility issues facing administrators are building deterioration (35%) and deferred maintenance (26%). 15% find their greatest problem is indoor air quality, which is typically allied with building deterioration and maintenance problems.
2. 40% of the administrators believe their inadequate facilities are a result of deferred maintenance.

3. When utility bills exceed the budget, 66% of the school boards cut maintenance to make ends meet.
4. The deferred maintenance price tag in Ontario schools has reached $396 million.



Reasons for Building Inadequacy

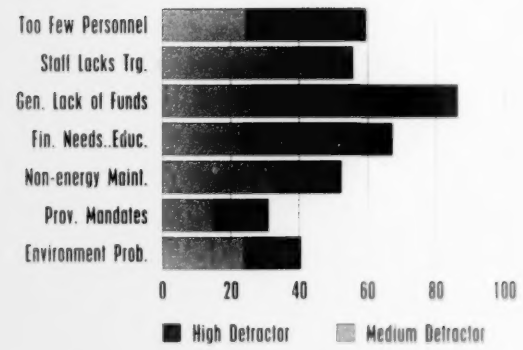
Ontario school administrators have managed to keep 43% of their buildings in the "excellent" column, but 1,083 have already slid into the inadequate category. Problems with the structure and the building shell (with "deterioration" listed as the biggest concern in both cases) accounted for 43% of the substandard buildings. The major cause for mechanical and electrical problems of inadequate buildings is "old, outdated," which points to the age of Ontario buildings as an underlying concern.

ENERGY: A GROWING OPPORTUNITY

Increased energy and operational efficiency can yield critical funds that will offer the opportunity to reverse the growing deferred maintenance burden and focus more resources on building renewal.

Ontario schools budgeted $16.9 million more for energy for the 1992-93 school year than they spent in 1991-92, bringing the total energy budget to $252 million.

58% of the school boards do not have an effective energy program in place and nearly one-fourth have never audited any of their school buildings. Of those who have conducted energy audits, 44% have not implemented most of the recommendations. Given these conditions, Ontario schools could probably reduce their energy costs by $59 million per year. Subsequent operational savings could equal this energy savings potential.



Major Barriers to Energy Efficiency Work

Ontario school boards are frequently unable to access these savings due to a general lack of funds. 86% cite lack of funds as a barrier while 69% point to the educational program demands on their limited resources. Given the province's fiscal condition, it does not appear to be a viable source of funds. An increasingly attractive alternative is private sector energy efficiency financing, which has been used by 23% of the boards in the past. 37% plan to cut energy and operational costs by using this source in the future.

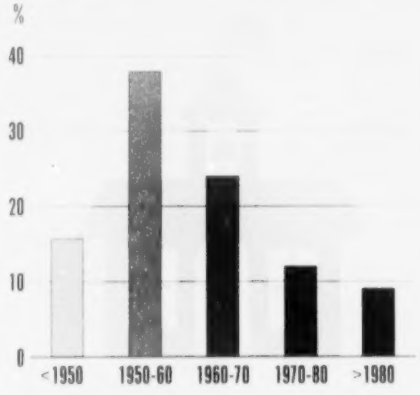
Quebec

Student Enrolment: 1,143,800
School Buildings: 2,917
School Boards: 202

Educational Funding: $6.1B
Provincial Share: 92%

BUILDING AGE

Quebec has the questionable distinction of having the largest percentage of school buildings living on borrowed time. 62% of its buildings are 50s-60s "baby boom" structures, initially intended to last about 30 years. Conversely, it has the lowest percentage of buildings built in the 1970s; and, at 9%, by far the lowest percentage of building stock constructed since 1980.

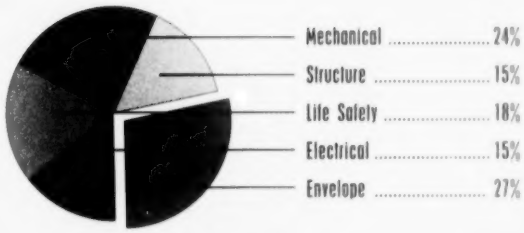


School Construction by Decades

STUDENT ACHIEVEMENT AND THE CONDITION OF QUEBEC SCHOOLS

73% of school administrators surveyed believe the learning environment is a "key factor" in student achievement, while 9% think it is an "absolutely critical" concern. Despite the age of its buildings, 52% of the provincial building stock are rated as excellent, 44% as adequate and only 4% as inadequate. These ratings suggest the province and the local school boards have taken exceptional care of their aging schools.

Of the 117 buildings that are considered inadequate, 27% of the facilities have problems with the envelope (principally deterioration) and 24% with the mechanical system. 43% of the mechanical systems were just too old and another 25% have problems with ventilation and indoor air quality. A relatively high percentage (18%) of the buildings have safety concerns with half of those unable to meet code.



Reasons for Building Inadequacy

THE MAINTENANCE DRAIN

Extensive evidence points to the progressive difficulty and increasing costs incurred in maintaining aging facilities. Nearly half of the Quebec administrators, sensitive to this growing concern, cited building deterioration as their biggest facility issue.

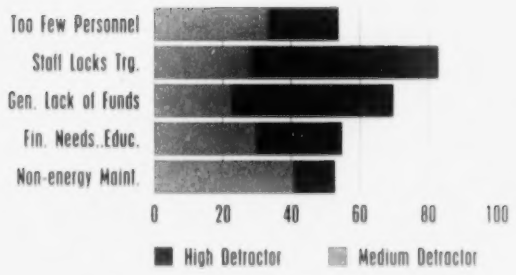
Deferred maintenance has grown to $142/pupil, reaching the current level of $162 million in the province. And the problem is apt to grow worse. When utility bills exceed the budget, 64% of the boards cut maintenance to make ends meet. Quebec schools raised their energy budget $6 million this past year, but only 80% thought that would be enough to cover their growing utility costs. Quebec is second only to Manitoba in per pupil energy costs.

ENERGY: A DOLLAR RESOURCE

Quebec's high energy costs have fostered considerable energy saving activity. The province has the highest percentage of effective energy programs (53%) and the lowest percentage of boards that have not audited any of their buildings (16%).

Still, high energy costs offer the opportunity to recapture more dollars through energy efficiency. Despite the Quebec schools' excellent energy program record, 47% of the boards do not have effective programs and 31% are not implementing most of the audit recommendations, usually due to a lack of funds. Quebec schools should be able to reduce their energy costs by more than $28 million per year. Subsequent operational savings could double this figure.

Many factors inhibit accessing these "revenues." Lack of funds is the greatest barrier (70%) with financial demands of educational programs on limited resources second (55%). The maintenance drain to serve its aging building population also takes its toll with 54% pointing to too few personnel and 55% noting non-energy related demands on the limited maintenance staff. Quebec schools have compensated for these barriers by relying heavily in the past on private sector energy financing (41%) and 21% plan to use this resource in the future.



Major Barriers to Energy Efficiency Work

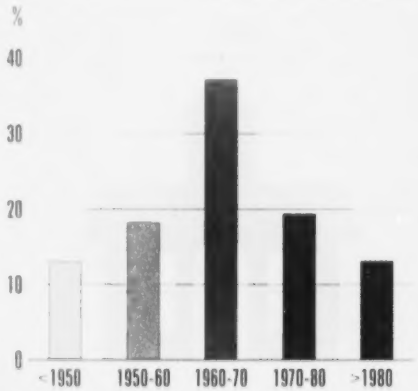
Atlantic Provinces

Prov.	NB	NFLD	NS	PEI
Enrolment	141,850	124,150	167,930	24,570
School Bldgs.	460	522	529	71
School Systems	42	27	21	5
Educ. $ (1990-91)	573.6M	542.6M	733.4M	107.1M
Prov. Share	100%	94%	80%	100%

The limited number of school systems in the individual Atlantic Provinces made it statistically desirable to analyze the data of these four provinces collectively. As a consequence, the unique characteristics and individual provincial needs may not be fully revealed in the data.

BUILDING AGE

Two out of three buildings have outlived their predicted useful life. 50% are the 50s-60s "baby boom" buildings originally intended for approximately 30 years' use. Another 13% were built before 1950. The Atlantic Provinces have a greater percentage of post-1970 buildings than the other eastern provinces, but are slightly below the national average.



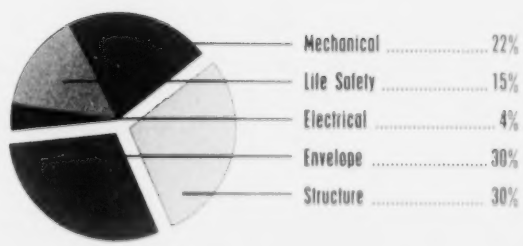
School Construction by Decades

STUDENT ACHIEVEMENT AND THE CONDITION OF ATLANTIC PROVINCE SCHOOLS

Administrators in the Atlantic Provinces are more convinced than administrators in other provinces that student achievement is affected by the condition of the learning environment. 23% stated it is "absolutely critical," while 68% indicated it is a "key factor."

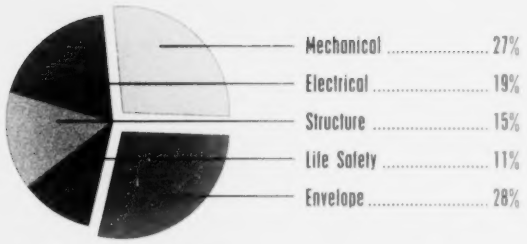
Consistent with this belief, 87% of the schools are in adequate to excellent condition. Despite these accomplishments, nearly 60,000 students go to school in Atlantic Canada each day in buildings considered to be inadequate places for learning.

The most frequent problem in the 205 substandard schools is not the typical mechanical needs, but difficulties with the building shell. Cited problems were equally divided between envelope and structure but, by far, the greatest concern in both cases was building deterioration.



Reasons for Building Inadequacy

3. When utility bills exceed the budget, 66% of the school boards cut maintenance to make ends meet.
4. The deferred maintenance price tag in Ontario schools has reached $396 million.



Reasons for Building Inadequacy

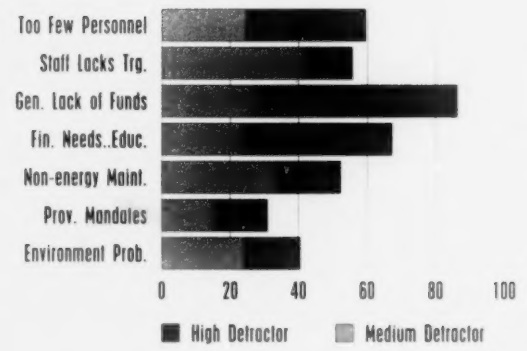
Ontario school administrators have managed to keep 43% of their buildings in the "excellent" column, but 1,083 have already slid into the inadequate category. Problems with the structure and the building shell (with "deterioration" listed as the biggest concern in both cases) accounted for 43% of the substandard buildings. The major cause for mechanical and electrical problems of inadequate buildings is "old, outdated," which points to the age of Ontario buildings as an underlying concern.

ENERGY: A GROWING OPPORTUNITY

Increased energy and operational efficiency can yield critical funds that will offer the opportunity to reverse the growing deferred maintenance burden and focus more resources on building renewal.

Ontario schools budgeted $16.9 million more for energy for the 1992-93 school year than they spent in 1991-92, bringing the total energy budget to $252 million.

58% of the school boards do not have an effective energy program in place and nearly one-fourth have never audited any of their school buildings. Of those who have conducted energy audits, 44% have not implemented most of the recommendations. Given these conditions, Ontario schools could probably reduce their energy costs by $59 million per year. Subsequent operational savings could equal this energy savings potential.



Major Barriers to Energy Efficiency Work

Ontario school boards are frequently unable to access these savings due to a general lack of funds. 86% cite lack of funds as a barrier while 69% point to the educational program demands on their limited resources. Given the province's fiscal condition, it does not appear to be a viable source of funds. An increasingly attractive alternative is private sector energy efficiency financing, which has been used by 23% of the boards in the past. 37% plan to cut energy and operational costs by using this source in the future.

Appendix A

Research Procedures & Respondent Data

In order to learn as much as possible about fiscal conditions and education in each respective province, a background study was made. The recent annual report from each Ministry of Education was reviewed, administrators across Canada and personnel from the various ministries were interviewed in person or by phone and a literature search was conducted with the assistance of the Canadian Education Association.

Based on this information, the survey instrument was developed and critiqued by administrators. The final survey form* and a cover letter were sent in February 1993 by the Ontario Association of School Business Officials to the director/superintendent of every school system in Canada, using the mailing list supplied by the Ontario Institute for Studies in Education. A second mailing was sent to non-respondents in April, 1993.

The response rate for the country was 42%, including the territories. The data were not sufficient from the territories to include them in the analysis, and it became statistically desirable to combine the data from the Atlantic Provinces for analysis. The number of surveys sent, the number returned and the response rates by province are presented in Table A-1.

Since surveys were sent to the entire population of school systems in Canada, no samples were taken and, therefore, no statistical inferences apply. The level of confidence the reader can put in the data must be determined by the response rate and respondents' ability to answer the items knowledgeably.

TABLE A-1. SURVEY DATA BY PROVINCE

SURVEYS	BC	AB	SK	MB	ON	PQ	ATL
Sent	75	129	101	55	151	155	70
Returned	21	56	50	29	86	45	22
Response Rate	28%	43%	50%	53%	57%	29%	46%

308 usable responses were received representing 6,838 school buildings (43%) and 2,293,773 elementary and secondary students (44%). All but two responses were from systems primarily funded by public sources; thus, care should be taken in applying the data to privately funded schools. Over half of the systems responding were mid-sized (1,000-8,000 enrolment) with the rest made up of 29% large systems (>8,000) and 15% small systems (<1,000). 40% of the responses came from mostly urban systems, 34% from mostly rural and 26% from mixed urban/rural.

Data were analyzed by province (Atlantic Provinces combined) and in aggregate for the country, then by school system size and rural/urban status.

RESPONDENT DATA

Survey respondents consisted of 35% business officials, 33% directors of plant or maintenance, and 26% senior management. Respondents' position within the systems varied considerably by province. As shown in Table A-2, Quebec had 55% senior management, while the Atlantic Provinces and Saskatchewan relied more heavily on business officials and British Columbia and Ontario depended primarily on directors of plant or maintenance.

TABLE A-2. RESPONDENT POSITION (%)
by Province

POSITION	BC	AB	SK	MB	ON	PQ	ATL
Sr. Management	26	21	27	28	13	57	23
Business Official	16	41	59	21	28	26	50
Directors of Plant, Maint.	53	30	14	41	57	10	18
Other	5	7	0	10	2	7	9

66% of the respondents had primary responsibility for energy efficiency in the school system, and 64% of those had carried that responsibility for more than five years. Only 13% of those with energy responsibilities spend more than 20% of their time at this task, and those spending more than 40% of their time are in systems with enrolments greater than 1,000.

* A copy of the survey questionnaire can be obtained from Honeywell Limited, Communications, 155 Gordon Baker Road, North York, Ontario M2H 3N7.

Appendix B

Comparable Data Regarding U.S. School Facilities

A similar study to the Canadian Schoolhouse in the Red was conducted in the United States during 1991-1992.* Some of the basic findings are offered here for those who would like to compare school conditions in Canada with those in the U.S.

BUILDING AGE

As shown in Table B-1, 31% of the U.S. buildings were built before 1950, 43% are 50s-60s buildings and 25% have been built since 1970.

TABLE B-1. AGE OF SCHOOL FACILITIES
by District Size and Geographical Region

		District Enrolment			Region of the U.S.			
% Built:	Total Sample (Mean)	10,000 or More	1,000 to 9,999	Less Than 1,000	North East	South East	Central	West
Before 1950:	31*	25	25	33	29	21	32	29
1950-1959:	21	23	24	18	24	22	22	15
1960-1969	22	23	22	21	24	21	24	19
1970-1979	14	14	14	15	10	19	11	20
1980-Present	11	13	12	10	12	14	8	15

** Reported in percentages calculated from raw data. Totals will not necessarily equal 100.*

FACILITY CONDITIONS

U.S. administrators rated 53% of their schools as excellent, 34% adequate and 12% as inadequate; thus, the inadequate schools numbered 13,200, which served five million students. Inadequacy was greatest in the Southeast (16%) and least in the West (10%). The most frequent reason for inadequacy was "too old" (49%). Other reasons were mechanical problems (30%), and envelope/structure (25%).

** A copy of U.S. study, Schoolhouse in the Red, can be obtained from the American Association of School Administrators, 1801 North Moore St., Arlington, VA 22209 USA. The cost is US$6.95 plus postage & handling.*

BEST COPY AVAILABLE

INDOOR AIR QUALITY

While the issue in U.S. schools at the time the report was issued had not reached the level of concern expressed by Canadian administrators, it was considered one of eight major issues in the report. The U.S. issue was rooted in health concerns for students and staff as well as economic and legal issues for school districts. Research had shown that compliance with ASHRAE 62-1989, "Ventilation for Acceptable Indoor Air Quality," would increase energy costs an average 20 percent. Of increasing concern to U.S. schools was mounting litigation and the fact that insurance policies offered no protection. Empirical data revealed that the major cause of indoor air quality problems was poor or inadequate maintenance.

THE ENERGY OPPORTUNITY

The cost of energy to U.S. elementary secondary schools had reached an all-time high of US$7.4 billion in the 1991-1992 school year, or approximately US$171/student. The potential energy savings was placed at US$1.85 billion per year.

46% of the school districts had effective energy programs; 54% did not. 35% of the districts had not conducted any audits.

The U.S. study revealed a lack of understanding among school administrators of what measures were most cost-effective. Most U.S. administrators in the survey stated that heating was most cost-effective and the building envelope work second. (U.S. Department of Energy study has shown that controls are most cost-effective and the envelope work least cost-effective.)

The major barriers to energy efficiency work in all areas of the country and all size districts were in declining order:

- ✓ general lack of funds
- ✓ financial needs of education programs
- ✓ the money required to meet environmental mandates

The five sources of funds available to do energy work in the states were identified as: (1) general operating funds (local, state, federal); (2) federal state grants; (3) bonds; (4) utility technical assistance and rebates; and (5) performance contracting (guaranteed savings contract). With fiscal resources as constrained in the states as in Canada, the only viable options appeared to be utility support and performance contracting. Performance contracting had doubled to 20% from the time of an earlier 1988 study. 3,000 school districts were using some kind of performance contract at the time of the survey. Large districts promised to be most active in the future with a 23% planned increase in reliance on this energy efficiency financing source.

RESEARCH DESIGN AND DATA ANALYSIS

Districts were sampled in the U.S. and returns provided a 95% confidence level with a ± 3% accuracy in the data. 61% of the respondents were superintendents of schools; 20% were directors of physical plant, maintenance; and 12% were business officials. The data were analyzed by district size, then collapsed and analyzed by regions of the country. Responses were analyzed in aggregate and by categories.

ACKNOWLEDGEMENTS

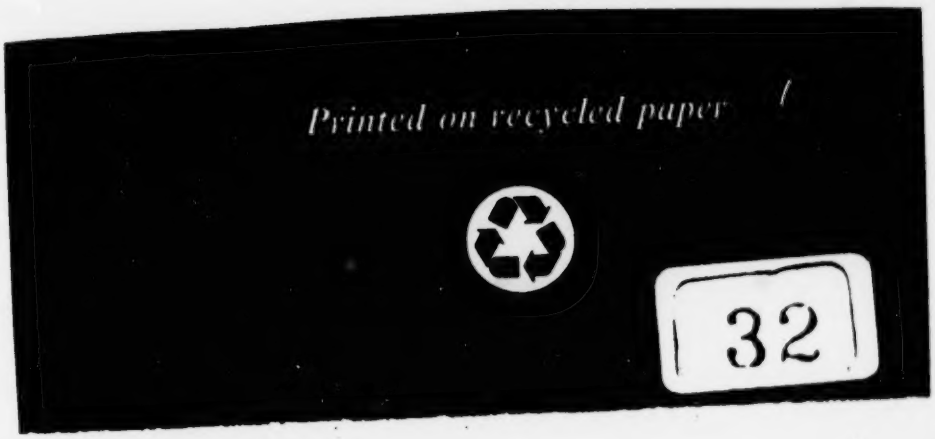
The Ontario Association of School Business Officials (OASBO) would like to thank Honeywell Limited for sponsoring this survey, and Dr. Shirley Hansen, who directed the project and authored this report. We would like to express our sincere appreciation to those who responded to our survey. We would also like to acknowledge the support of the other provincial school business official groups who encouraged their members to respond to this survey, and their officers, who helped us interpret some of the data.

Background data were obtained from a wide array of sources, and the assistance of many groups and individuals is very much appreciated. We would especially like to thank some of the directors of facilities in the Ministries of Education for their time and valuable contributions to this effort: Richard Connolly of the British Columbia ministry; Marian Weleschuk, Alberta; Irv Brunas, Saskatchewan; Steve Mitchell, Ontario; and Roméo Lajoie, Quebec. Diane Sibbett, Librarian for the Canadian Education Association, was exceptionally helpful.

OASBO would also like to acknowledge that this study was patterned after the work done by the American Association of School Administrators (AASA) in the United States, and to thank AASA for allowing us to share some of its findings in Appendix B.

Within OASBO, special thanks go to Mike Graham who carried primary project responsibility for the Association, John Stecyk for his very able assistance, and Ron McKnight whose idea it was to bring the project to Canada.

This report is offered to assist anyone interested in assessing and improving Canadian school buildings. Neither the Ontario Association of School Business Officials, nor any of its employees, consultants, or sponsors makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, product, or process disclosed. Any reference to any specific commercial product, or process does not necessarily constitute or imply its endorsement, recommendation, or favouring by OASBO or its agents.



BEST COPY AVAILABLE